Small Business Innovation Research/Small Business Tech Transfer

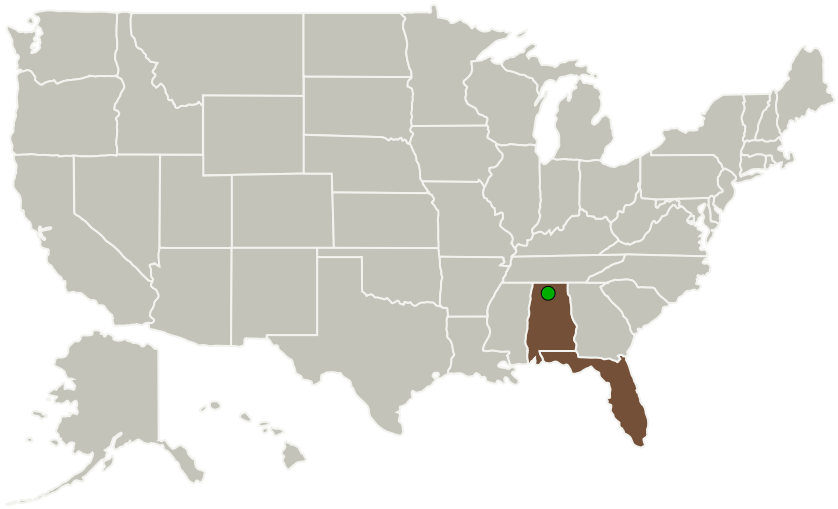
Additive Manufacturing Applied to LOX - Methane Turbopumps, Phase I

Completed Technology Project (2015 - 2015)

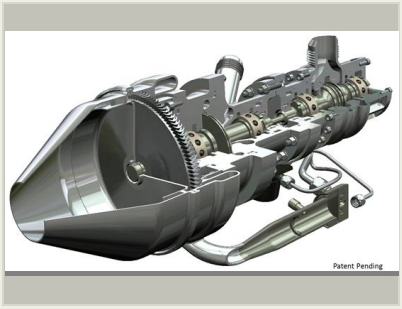
Project Introduction

Florida Turbine Technologies' (FTT) proposes an Additively Manufactured Modular Pump (AMMP) to provide a major leap forward in the Technology Readiness Level (TRL) of combined Additive Manufacturing (AM) technologies to dramatically reduce the cost, development lead time and subsequent deployment of a scalable, modular turbopump for rocket engine developers. This Phase I program will take the initial steps that will result in a test-ready, 10,000 pound thrust (10k) class LOX-Methane turbopump by the end of Phase II. Not only will this design demonstrate the significant savings in cost and time that can be realized with AM technologies, the proposed concept is designed to be inherently throttleable, will demonstrate high speed, high margin impellers, eliminates many traditional sources of leakage, and operates with propellant lubricated bearings.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Florida Turbine Technologies, Inc.	Lead Organization	Industry	Jupiter, Florida
Marshall Space Flight Center(MSFC)	Supporting Organization	NASA Center	Huntsville, Alabama



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Completed Technology Project (2015 - 2015)

Primary U.S. Work Locations	
Alabama	Florida

Project Transitions

June 2015: Project Start

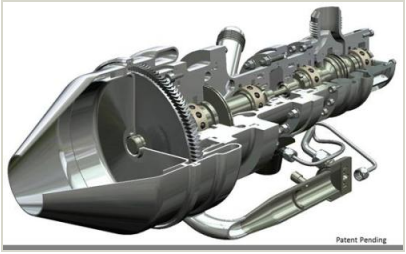
December 2015: Closed out

Closeout Summary: Additive Manufacturing Applied to LOX - Methane Turbopumps, Phase I Project Image

Closeout Documentation:

- Final Summary Chart Image*(https://techport.nasa.gov/file/138775)*

Images



Briefing Chart Image
Additive Manufacturing Applied to LOX - Methane Turbopumps, Phase I
(https://techport.nasa.gov/image/127014)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Florida Turbine Technologies, Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

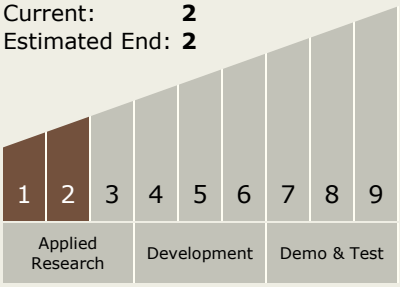
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Alex Pinera

Technology Maturity (TRL)

Start: **1**
Current: **2**
Estimated End: **2**



Additive Manufacturing Applied to LOX - Methane Turbopumps, Phase I

Completed Technology Project (2015 - 2015)

Technology Areas

Primary:

- TX01 Propulsion Systems
  - TX01.1 Chemical Space Propulsion
    - TX01.1.3 Cryogenic

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System